producing the characters of the divers parts of the plants and of their variations." Prof. Schimper's later years were devoted to the study of vegetable paleontology.

THE BOTANIC GARDEN at Cambridge is no longer a local, but a national concern. The eyes and thoughts of the botanists of this country are directed to it as naturally as are those of English, in fact the world's, botanists, to the Kew Gardens. There we find the largest herbarium, the largest library, the largest collection of living plants, indigenous to our own country, to be found anywhere on the continent. But still we can have more, and what is more to the point, we are going to have it. The present director, Prof. George L. Goodale, is a man of indomitable energy, and his heart is in this work of developing the Garden. He can keep more irons in the fire at once, and have them all hot, than any gentleman of our acquaintance. Of course improvement means money, and money is what botanists are not generally blessed with, and hence we will not make a financial appeal to them, although about $80,000 would be very acceptable. But botanists, more than any other persons, know good plants and where they can be procured, and if the botanists of this country would make it a point to send good living roots or seeds of their local rarities to Cambridge, they would be doing themselves very little inconvenience, and might do the Garden great good. The best plan would be to send to the Director a list of rare plants whose roots or seeds can be procured by the writer, and then all needless trouble would be avoided. Mr. Sereno Watson has in charge the naming of the large collection already under cultivation, and his name is a guarantee to botanists that all the labels can be depended upon.

VITALITY OF THE SEEDS OF SEROTINOUS CONES.—On page 54 Prof. Sargent gave the results of his experiments with serotinous (closed) cones of *Pinus contorta*, which I had collected in 1874 in Colorado, kept for more than four years in a garret, and sent to him in the spring of 1879. Seeds of cones 13 years old and 10 years old did not germinate; one out of six of 9 year old seeds, one out of eleven of 8 year old seeds, one out of three of 7 year old and one out of four of 6 year old seeds germinated and grew up well; those of 5 year old cones did not come up. Prof. Sargent pronounces the result to be unsatisfactory. To me it seems to be eminently satisfactory. It proved that part of the seeds from cones 5 to 9 years old had retained their vitality and that those that are older than 9 years failed; younger ones would undoubtedly have also germinated had such been experimented upon. The result shows that pine seeds of serotinous cones, or, to be more exact, seeds of *Pinus contorta*, kept under the circumstances detailed above, could and did retain their vitality a number of years—even nine years—while the perishable nature of pine seeds under ordinary circumstances is well known. The economy or the effect of keeping the cones closed is therefore evidently the preservation of the vitality of the seeds for a number of years beyond their maturity. What is not fully known and what will have to

be investigated, is how and when such seeds of serotinous cones are eventually liberated and made available, and whether not a great many of them at last perish, the cones never opening.—G. ENGELMANN.

FRAXINUS QUADRANGULATA has, at least about Allenton, in St. Louis county, Missouri, hermaphrodite flowers. Mr. G. W. Letterman finds it there common on rocky hills where it is a small tree or shrub with blunt angles of the branchlets, and in rich bottom lands, where the tree is large, and the angles of the branchlets sharp and even winged. Leaves are sometimes in threes when the branchlets show six angles. The terminal buds are gray-downy. In both localities the flowers are hermaphrodite. The calyx is practically absent, or indicated only by two obscure knobs or two minute scales, alternating with the stamens; the anthers are sessile and (before opening) reniform, their two cells being united above; stamens somewhat persistent at least to the beginning of May, when the young obovate-oblong fruits, already somewhat twisted (which twist is more marked in the mature fruit), have reached about half their full size. How does the species behave in other parts of the country? The style of *Fraxinus Americana* is very slender—much longer than the ovary; that of *F. viridis* does not much exceed the ovary.—G. ENGELMANN.

NOTULÆ EXIGUÆ.—THREE-FLOWERED BLOODROOT.—Among the anomalies occasionally met with, the most unexpected is a scape of *Sanguinaria Canadensis*, found by Mr. E. N. Wheeler, in the vicinity of Boston, bearing a pair of opposite bracts about half an inch below the terminal flower, each bract with a well-formed flower in its axil!

TRILLIUM SESSILE, as we learn from Mr. Lehman, of Salem, North Carolina, and from a specimen sent by him, abundantly occurs in the neighborhood of Kingston, Tenn., with bright yellow petals; and I have recently heard of this form from other western sources. Specimens, and especially living roots, taken up in autumn, are desired.

PERULARIA VIRESCENS is the proper name for *Habenaria* (*Perularia*) *virescens* of Gray's Manual. The examination of fresh specimens shows the "*cuculli bivalves*" of Lindley, the two lips of the base of the anther-cell which fairly cover the gland. In Florida specimens just received from Miss Reynolds, of Florida, the outer lip is the larger, or the one which principally protects the gland. How is it in the northern plant? It has long since been announced by me in Am. Jour. Sci., that *Orchis rotundifolia*, Pursh, is a true Orchis.—A. GRAY.

PLATANTHERA BRACTEATA, Torr.—This is usually regarded as a summer flowering species. In my garden, where it has bloomed for the first time this season, it is the earliest of many that I have. The first flowers were open on the 26th of April, and half of the spike had opened by the 1st of May. Hitherto *Orchis spectabilis* has been the